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| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Statistics and Probability *toward* Foundation Level Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* discuss and identify contingent events such as ‘my soccer team will score more than two goals in their next match’
* identify subsets of a larger set according to whether the elements of the set satisfy a given property or not, such as ‘the set of students in my class with green eyes’
* check whether a statement is true or not about a given data display, such as ‘dogs are the most common pet in my class’
* create simple data displays based on yes-no questions such as ‘is red your favourite colour?’
* **Content Descriptions:**

Answer yes/no questions to collect information [(VCMSP083)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP083)Organise answers to yes/no questions into simple data displays using objects and drawings [(VCMSP084)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP084) |
| **Example of Indicative Progress toward Foundation Level Achievement Standard** | **Mathematics Foundation Level Achievement Standard** |
| In **Mathematics**, indicative progression towards the Foundation Level achievement standard may be when students:* identify events that ‘may happen’ or ‘may not happen’ in a familiar context

 * identify a subset of a larger set of objects by deciding whether a particular property applies or not to elements of the larger set
 | By the end of Level 1:* Students sort familiar categorical data into sets and use these to answer yes/no questions and make simple true/false statements about the data.
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| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Statistics and Probability *toward* Level 1 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* place objects or their images in cells on a pre-constructed grid
* produce picture graphs using the objects they sorted
* discuss situations where a range of events are likely to happen or not happen, for example, ‘it will rain today’ and state whether they think this will happen or not
* **Content Descriptions:**

Identify outcomes of familiar events involving chance and describe them using everyday language such as ‘will happen’, ‘won’t happen’ or ‘might happen’ [(VCMSP100)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP100)Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays (VPMSP102) |
| **Mathematics Foundation Level Achievement Standard**  | **Example of Indicative Progress toward Level 1 Achievement Standard** | **Mathematics Level 1 Achievement Standard** |
| By the end of the Foundation level:* Students sort familiar categorical data into sets and use these to answer yes/no questions and make simple true/false statements about the data.
 | In **Mathematics**, indicative progression towards the Level 1 achievement standard may be when students:* describe events as ‘will happen’ or ‘won’t happen’ in a familiar context

 * sort object or their images and use these to produce picture graphs
 | By the end of Level 1:* Students describe data displays. They ask questions to collect data and draw simple data displays.
* Students classify outcomes of simple familiar events
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| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Statistics and Probability *toward* Level 2 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* explain why they think some events are ‘certain’ and others are ‘impossible’
* use tallies to record each time an event occurs
* construct picture graphs using technology

**Content Descriptions:**Identify practical activities and everyday events that involve chance. Describe outcomes as ‘likely’ or ‘unlikely’ and identify some events as ‘certain’ or ‘impossible’. (VPMSP125)Create displays of data using lists, table and picture graphs and interpret them [(VCMSP128)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP128) |
| **Mathematics Level 1 Achievement Standard**  | **Example of Indicative Progress toward Level 2 Achievement Standard** | **Mathematics Level 2 Achievement Standard** |
| By the end of Level 1:* Students describe data displays.
* They ask questions to collect data and draw simple data displays.
* Students classify outcomes of simple familiar events.
 | In **Mathematics**, indicative progression towards the Level 2 achievement standard may be when students:* Explain why they think an event is 'certain' or 'impossible'
* record answers to questions by use of symbols (such as tallies) in pre-prepared tables.
 | By the end of Level 2:* Students collect data from relevant questions to create lists, tables and picture graphs with and without the use of digital technology.
* They interpret data in context.
* Students use everyday language to describe outcomes of familiar events.
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| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Statistics and Probability *toward* Level 3 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* investigate and discuss the relative likelihood of an event happening using everyday language
* conduct simple chance experiments, such as rolling die, where they notice and record variability in the frequency of an event
* collect data and display it using different forms such as tally, dot plot, picture graph, bar chart or pie chart with or without the aid of technology

**Content Descriptions:**Conduct chance experiments, identify and describe possible outcomes and recognise variation in results (VPMSP147)Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies (VPMSP149) |
| **Mathematics Level 2 Achievement Standard**  | **Example of Indicative Progress toward Level 3 Achievement Standard** | **Mathematics Level 3 Achievement Standard** |
| By the end of Level 2:* Students collect data from relevant questions to create lists, tables and picture graphs with and without the use of digital technology.
* They interpret data in context.
* Students use everyday language to describe outcomes of familiar events.
 | In **Mathematics**, indicative progression towards the Level 3 achievement standard may be when students:* order events in terms of how likely they are to happen
* prepare a variety of data displays for a given set of data and discuss their usefulness
 | By the end of Level 3:* Students carry out simple data investigations for categorical variables.
* They interpret and compare data displays.
* Students conduct chance experiments, list possible outcomes and recognise variations in results.
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| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Statistics and Probability *toward* Level 4 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* arrange given lists of events in anticipated order of likely occurrence and then check using experiments or additional information such as surveys
* discuss which pairs of events out of a set of possible events maybe independent or dependent
* use different types of displays for various types of data
* carry out simple surveys to answer questions of interest

**Content Descriptions:**Describe possible everyday events and order their chances of occurring (VPMSP175)Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values (VPMSP179) |
|  | **Example of Indicative Progress toward Level 4 Achievement Standard** | **Mathematics Level 4 Achievement Standard** |
| By the end of Level 3:* Students carry out simple data investigations for categorical variables.
* They interpret and compare data displays.
* Students conduct chance experiments, list possible outcomes and recognise variations in results.
 | In **Mathematics** indicative progression towards the Level 4 achievement standard may be when students:* order events in a familiar context in terms of their relative likelihood
* select and trial methods for data collection and representation
 | By the end of Level 4:* Students describe different methods for data collection and representation, and evaluate their effectiveness.
* They construct data displays from given or collected data, with and without the use of digital technology.
* Students list the probabilities of everyday events.
* They identify dependent and independent events.
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| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Statistics and Probability *toward* Level 5 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* use a continuous number line with the section from 0 to 2 enlarged to indicate probabilities corresponding to various sets of events
* discuss questions such as ‘why can’t an event have a probability of 1 ½ ?’
* identify events where the corresponding points on the number line are 0, ½ or 1 and explain why this is the case
* use technology to explore different types of data display and their suitability in relation to questions on gathered or provided data

Content Descriptions: Recognise that probabilities range from 0 to 1 [(VCMSP204)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP204)Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies [(VCMSP206)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP206) |
| **Mathematics Level 4 Achievement Standard**  | **Example of Indicative Progress toward Level 5 Achievement Standard** | **Mathematics Level 5 Achievement Standard** |
| By the end of Level 4:* Students describe different methods for data collection and representation, and evaluate their effectiveness.
* They construct data displays from given or collected data, with and without the use of digital technology.
* Students list the probabilities of everyday events.
* They identify dependent and independent events.
 | In **Mathematics**, indicative progression towards the Level 5 achievement standard may be when students:* indicate probabilities of events by locating corresponding points in the interval from 0 to 1 on a number line
* use different forms of data display available through technology and discuss the suitability of display type in relation to question posed and data gathered
 | By the end of Level 5:* Students pose questions to gather data and construct various displays appropriate for the data, with and without the use of digital technology.
* They compare and interpret different data sets.
* Students list outcomes of chance experiments with equally likely outcomes and assign probabilities as a number from 0 to 1.
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| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Statistics and Probability *toward* Level 6 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* investigate variability and trend in simulations of simple change experiments in the long run, and compare these to a priori expectations from counting or symmetry
* obtain articles from the media and discuss how statistics has been used to support arguments and points of view
* research secondary sources on the internet to obtain background statistics on topical issues or questions

**Content Descriptions:**Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies [(VCMSP233)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP233)Interpret secondary data presented in digital media and elsewhere (VPMSP236)  |
| **Mathematics Level 5 Achievement Standard**  | **Example of Indicative Progress toward Level 6 Achievement Standard** | **Mathematics Level 6 Achievement Standard** |
| By the end of Level 5:* Students pose questions to gather data and construct various displays appropriate for the data, with and without the use of digital technology.
* They compare and interpret different data sets.
* Students list outcomes of chance experiments with equally likely outcomes and assign probabilities as a number from 0 to 1
 | In **Mathematics**, indicative progression towards the Level 6 achievement standard may be when students:* use technology to simulate simple chance experiments in the long run based on random numbers
* analyse the use of statistics in media articles and discuss any limitations or caveats with respect to views being argued
 | By the end of Level 6:* Students interpret and compare a variety of data displays, including displays for two categorical variables.
* They analyse and evaluate data from secondary sources.
* Students compare observed and expected frequencies of events, including those where outcomes of trials are generated with the use of digital technology.
* They specify, list and communicate probabilities of events using simple ratios, fractions, decimals and percentages.
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| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Statistics and Probability *toward* Level 7 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* investigate the robustness of mean, median, mode and range with respect to changes in some values of a data set
* analyse data (steps, heart-rate, sleep patterns) from a personal fitness device
* calculate mean, median and mode for a range of data sets and compare their location in terms of the shape of the distribution of the data
* work backwards from mean, range and shape of distribution to identifying source data sets, such as from summary weather data for world capital cities to identification of likely city
* use various experiments involving spinners, dice and other random devices to specify sample spaces for simple one-step experiments, and calculate corresponding probabilities as fractions, decimals and percentages, for cases involving equally likely outcomes and also some cases involving non-equally likely outcomes

.**Content Descriptions:**Construct sample spaces for single-step experiments with equally likely outcomes [(VCMSP266)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP266)Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data [(VCMSP270)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMSP270) |
| **Mathematics Level 6 Achievement Standard**  | **Example of Indicative Progress toward Level 7 Achievement Standard** | **Mathematics Level 7 Achievement Standard** |
| By the end of Level 6:* Students interpret and compare a variety of data displays, including displays for two categorical variables.
* They analyse and evaluate data from secondary sources.
* Students compare observed and expected frequencies of events, including those where outcomes of trials are generated with the use of digital technology.
* They specify, list and communicate probabilities of events using simple ratios, fractions, decimals and percentages.
 | In **Mathematics**, indicative progression towards the Level 7 achievement standard may be when students:* write down the sample space for simple one-step experiments such as spinning a spinner in a game with different coloured segments corresponding to outcomes
* calculate mean, median and mode of like distributions, and describe and compare these distributions, such as resting and exercise heart-rates for a given cohort of students
 | By the end of Level 7:* Students identify issues involving the collection of discrete and continuous data from primary and secondary sources.
* They construct stem-and-leaf plots and dot-plots.
* Students identify or calculate mean, mode, median and range for data sets, using digital technology for larger data sets.
* They describe the relationship between the median and mean in data displays.
* Students determine the sample space for simple experiments with equally likely outcomes, and assign probabilities outcomes.

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